TECHNISCHE UNIVERSITÄT DRESDEN

http://www.inf.tu-dresden.de

FACULTY OF COMPUTER SCIENCE

FACULTY OF COMPUTER SCIENCE

With 1,845 students, the Faculty of Computer Science of the Technische Universität Dresden ranks among the largest education institutions for Computer Science in Germany. Twelve different degrees, such as Dr.-Ing., Dr. rer. nat., Diplom, Master, Bachelor, as well as several degrees for teaching, are offered. Besides classical Computer Science and Media Computer Science, students may choose from five more study programs, including two Master programs taught completely in English.

The history of Computer Science education at Dresden's IT location goes back to the beginnings of electronic computer engineering. Researchers from Dresden, under Prof. Dr.-Ing. habil. N. J. Lehmann's leadership, were among the first to conceive and build magnetic drum memory and to develop the first digital electronic computers. Today, more than 100 research projects are underway at TU Dresden, including the keystone project "Theseus", which aims to create a platform for the Internet of services, a project focusing on security improvements for operating systems by using micro-kernel technology, and the project "Zoomable Cell" - an interactive journey through the human cell.

The six Institutes of the Faculty of Computer Science cover the whole spectrum of computer science: from theory to practice, from basic research to application. Particularly high scientific competency and efficiency distinguish the faculty in the areas of software engineering, multimedia, operating systems, privacy and data security, parallel and distributed computing systems, intelligent systems, and formal methods.

Modern technology, teaching and learning driven by research and practice, internationally active professors and interesting main fields of research, as well as worldwide collaborations with universities and industry, create ideal studying conditions. In regards to course programs, study situations in general, and IT infrastructures, Dresden's Computer Science Faculty belongs with the best. Founded in 1828, the Technische Universität Dresden is one of the oldest and most venerable universities in Germany, with strong research and numerous national and international co-operations. It is a member of the TU9 – an association of the nine leading technical universities in Germany. 57 percent of all doctorates and 47 percent of all alumni in engineering, emerge from these universities.

Photo: Silvia Kapplusch

NUMBERS AND FACTS

Numbers:
6 institutes
23 professors and lecturers
280 employees
1845 students
more than 100 current research projects
more than EUR 8 million third-party research funds in 2009
79 doctoral students

Visiting address:
Nöthnitzer Str. 46
01187 Dresden

Postal address:
Technische Universität Dresden
Fakultät Informatik
01062 Dresden

http://www.inf.tu-dresden.de

Study programs:
Computer Science
Media Computer Science
IT Systems Engineering
Teacher education

Master study programs (English):
Computational Logic
Distributed Systems Engineering

European Master's Program in Computational Logic

Degrees:
Diplom
Bakkalaureat (outbound)
Bachelor of Science / of Education
Master of Science / of Education
Dr.-Ing. / Dr. rer. nat.

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as of: April 2010

Photo: Lothar Sprenger | www.lsprenger.de

NEWEST COMPUTER EQUIPMENT FOR RESEARCH AND STUDIES

The Faculty of Computer Science hosts over 240 state-of-the-art computer workstations in ten PC pools, which offer a wide range of software with the operating systems Windows, Linux, and Solaris. In addition to the extensive multimedia, hardware, and software inventory, there are special workplaces for video editing, audio editing, and virtual reality. The rooms are supervised by a team that assists in solving problems and answering questions immediately. Additional WLAN workplaces and a campus-wide supply of WLAN enable optimal working conditions in the whole building and its adjoining green spaces.

The Center for Information Services and High Performance Computing (ZIH) of the Technische Universität Dresden, the Center of Excellence for parallel computing and software tools, is the central scientific unit responsible for the entire communication infrastructure of the university. It undertakes tasks within data communication and information processing for research, teaching, and studies. Since the implementation of a high-performance computer with the SGI system Altix 4700 and the PC farm with AMD Opteron Dual Core CPUs, ZIH has also been supporting scientists from all over Saxony in their research.

ZIH offers several useful services and resources for students. For example, every student at the Technische Universität Dresden gets a user ID upon enrollment, which the student can use to publish personal websites through the ZIH home file system.

Via so-called VPN (Virtual Private Network), ZIH provides its users with protected access to the network area of the Technische Universität Dresden. This VPN access enables the use of resources and intranet services of the Technische Universität Dresden and the Sächsiche Landesbibliothek – Staats- und Universitätsbibliothek Dresden (SLUB), from any terminal outside of the Technische Universität Dresden network. For the protection of their personal computers, every member of the Technische Universität Dresden is provided with anti-virus software, which includes a free update service.

Using hardware from Sun Microsystems and the VMware Infrastructur 3 software, a virtual computer center was built at the faculty in 2008. The ESX-Cluster consists of three Opteron Sun Fire X4200 M2 servers, each with four 2.4 GHz CPUs and a main memory capacity of 16 GB, plus seven servers, each with four 3.2 GHz CPUs and a main memory capacity of 32 GB.

Next to the computer workstations in the computer center, the faculty has different laboratories, which are used for teaching hardware topics, group work, and research projects. Through the early integration of students into the different fields of research, the faculty educates specialists that are sought-after worldwide.

"In QuaOS, experts from the field of operating systems, automated theorem proving, and model checking, aim to develop innovative methods for the verification of operating systems."

Prof. Dr. rer. nat. Christel Baier

Photo: Florian Schneider | www.florian-schneider.info

QuaOS

QUANTITATIVE ANALYSIS OF OPERATING SYSTEMS

Today, increasingly complex software components control important or even safety critical systems. Examples can be found in intensive care, aeronautics, astronautics, traffic control and many other fields. In such critical systems, a single error can have far-reaching consequences. A formal analysis for the likelihood of timely and correct behaviour seems therefore vitally important. But even for less critical applications, such as multi-media streaming or network routers, users would appreciate guarantees for the likelihood that the applications behave correctly and in a timely manner. Quantitative model checking and theorem proving are two popular methods to provide such guarantees.

In the QuaOS project we seek to develop a new methodology, based on quantitative model checking and theorem proving, for the quantitative and functional analysis of software components. We focus on micro-kernels, which are currently proposed as the base software component of reliable and secure systems. Our new methodology should allow for the formal verification of quantitative probabilistic properties. Quantitative assurances on the application level depend on appropriate quantitative guarantees of the operating system kernel. We therefore focus on properties such as, for instance "In 99.9% of the cases the interrupt latency of the kernel is below 5 µs".

To investigate such quantitative properties, innovative methods and new mathematical models need to be developed. In the project we combine quantitative model checking and theorem proving such that these two verification techniques mutually support each other.

We expect that our project leads to new methods for the verification of quantitative probabilistic properties of software components. Such methods will in turn lead to more software being verified and therefore to more reliable systems.

Period
April 2010 – April 2012

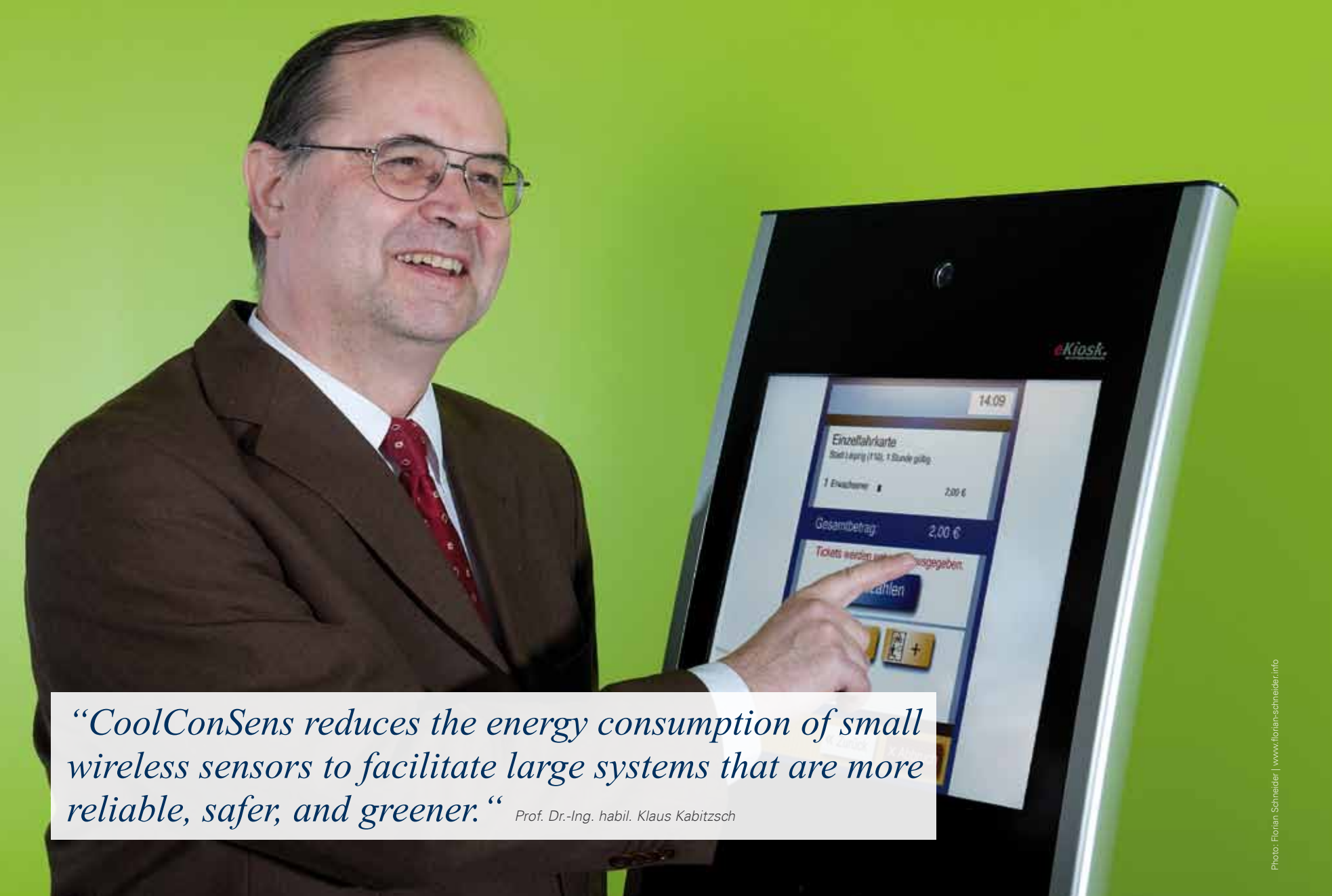
Project administration
Prof. Dr. Hermann Härtig
Prof. Dr. Christel Baier

Financing institution
German Research Foundation (DFG)

Partners TUD
Chair of Operating Systems, Chair of Algebraic & Logical Foundations of Computer Science

Research topics
Model Checking, Operating Systems, Quantitative Analysis, Software Verification

http://os.inf.tu-dresden.de/QuaOS



"CoolConSens reduces the energy consumption of small wireless sensors to facilitate large systems that are more reliable, safer, and greener." Prof. Dr.-Ing. habil. Klaus Kabitzsch

Photo: Florian Schneider | www.florian-schneider.info

ENERGY-EFFICIENT WIRELESS SENSOR NETWORKS

Innovations in micro- and nano-electronics are the foundation for modern information and communication technologies (ICT). But, the increasing usage of ICT systems produces the same amount of CO2 emissions as the entire civil air traffic. For example, 11 % of Germany's energy usage is consumed by ICT systems, with a strong upward trend. Therefore, one of the largest challenges right now is increasing the energy efficiency of ICT systems. The CoolSilicon cluster investigates related economic and ecologic topics in several projects such as CoolConSens.

CoolConSens aims at developing ultra low-power, real-time capable wireless sensor network solutions to facilitate reliable and maintenance free deployments. It follows a cross-layer approach that minimizes the energy consumption of sensors from hardware to software for measuring, data processing, communication, and self-diagnosis.

Wireless sensor networks are gaining momentum in a wide range of application areas due to their high flexibility. CoolConSens' focus area is acoustic condition monitoring that can detect defects and changes in materials of buildings, airplanes, machines, or wind turbines, and locate speakers in rooms.

The acoustic sensors are designed to harvest their energy from their environment for a long-term maintenance free operation. This requires ultralow power devices that contradict the needs of acoustic signal processing. CoolConSens addresses this conflict and not only reduces the energy consumption of the wireless device, but also enables new energy savings in the monitored systems.

Period
January 2010 – December 2012

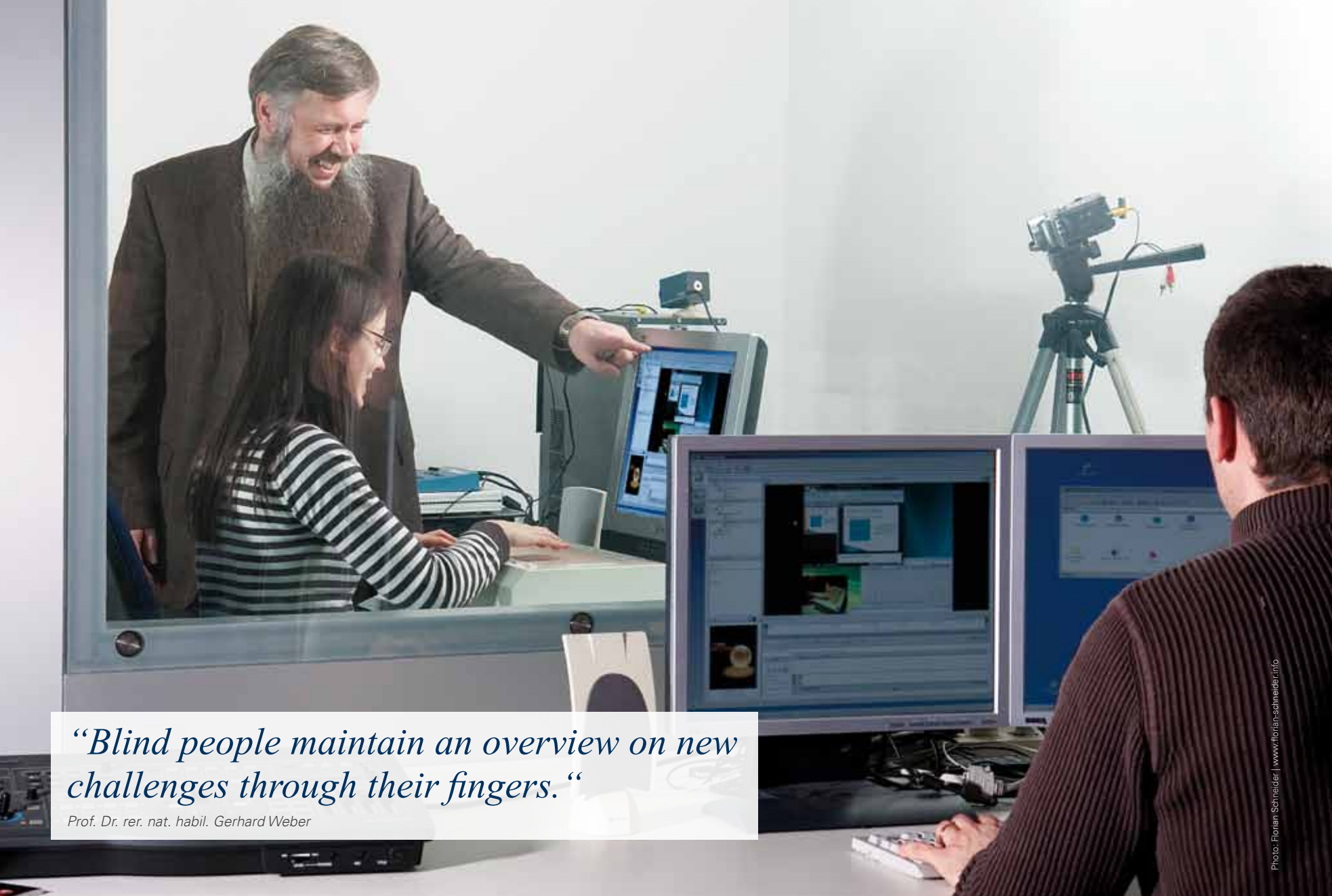
Project administration
Prof. Dr. Klaus Kabitzsch

Financing institution
Federal Ministry of Education and Research

External cooperation partners
Agilion GmbH, IMMS gGmbH,
VIC – voiceINTERconnect GmbH

Research topics
Energy efficiency; wireless sensor networks,condition monitoring; diagnosis & maintenance

http://www.iai.inf.tu-dresden.de/coolconsens



“Blind people maintain an overview on new challenges through their fingers.“

Prof. Dr. rer. nat. habil. Gerhard Weber

Photo: Florian Schneider | www.florian-schneider.info

HyperBraille®

MULTI-TOUCH FOR TACTILE GRAPHICS

Lack of transcriptions of graphical notations such as UML, or even just lack of access to presentation slides, is a major barrier for many blind people and in particular, blind computer scientists in their professional life. Project Hyperbraille's focus is to develop a large touch-sensitive tactile display for blind and visually impaired people.

This display significantly extends the amount of information perceived with two hands. Layout and graphical symbols are recognized in addition to Braille. When touching it, gestures are recognized and speech is generated. The Off-Screen Model can be validated for filtered off-the-shelf office software. It is the basis for a two-handed operation of a Braille window system, and makes multimodal interaction adaptable though a script language. Blind people may collaborate with sighted people through this Hyperreader, regardless of whether keyboard and/or mouse are used.

Gestural input through both hands allows for the changing of tactile views and for various interpretations of pixels. In order to use the many advantages of Braille, the traditional tactile output method, tactile graphics and widgets are rearranged accordingly and provided in a tactile rendering.

The design process of Hyperreader is user centered. Numerous individual studies with blind subjects in the Usability Lab of the Dept. of Computer Science and at partner sites allow sighted developers to understand and repeatedly improve their tactile and acoustic designs.

Blind people will still not be able to watch television using the Hyperbraille system, or become graphics designers, but some of them could explore new professional areas and many will find it easier to gain an overview of graphical notations such as UML, mathematics, or chemistry.

Period
April 2007 – December 2010

Project administration
Prof. Dr. Gerhard Weber

Financing institution
Federal Ministry of
Economicsand Technology

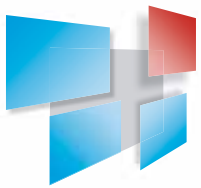
External cooperation partners
Blista, Metec AG, Papenmeier GmbH,
Universität Potsdam, Universität Stuttgart
(IMS, IZFM, VIS)

Research topics
Multimodal Human-Computer Interaction

http://www.hyperbraille.de

"Composite service-oriented intelligent user interfaces are the basis for the next generation of rich-internet-applications." Prof. Dr.-Ing. Klaus Meißner

Photo: Florian Schneider | www.florian-schneider.info



CRUISe

COMPOSITION OF RICH USER INTERFACE SERVICES

The modern internet represents an interaction and communication platform, where many software manufacturers provide their products as services, e. g. Google Apps and Microsoft Office Live. Time- and location-independent availability, enhanced reliability, performance, and scalability facilitate the provision of Rich Internet Applications (RIA), which are intentionally designed to be similar to desktop applications in regards to their appearance, functionality, und interaction paradigms. But this business model, known as Software-as-a-Service, does not yet cover the user interfaces of such web applications.

In our research project CRUISe (Composition of Rich User Interface Services), we are studying possibilities of extending the advantages of web-based services to the presentation layer. By providing user interface components in a service-based fashion, new ways of creating adaptive and dynamically configurable application user interfaces are established that are aware of user, usage, and device contexts. From the developer's point of view, the uniform modeling approach of such applications and their services is of central interest. Development time and cost efforts are optimized, since the approach facilitates the encapsulation of heterogeneous technologies and the reusability of complex UI components within different distributed runtime platforms. Furthermore, testing and maintaining composite web applications is simplified.

As a result, web developers that are overwhelmed by a myriad of different devices and platforms are given new, convenient opportunities for managing the multitude of new applications and user groups, as well as their growing mobility.

Period
November 2008 – October 2010

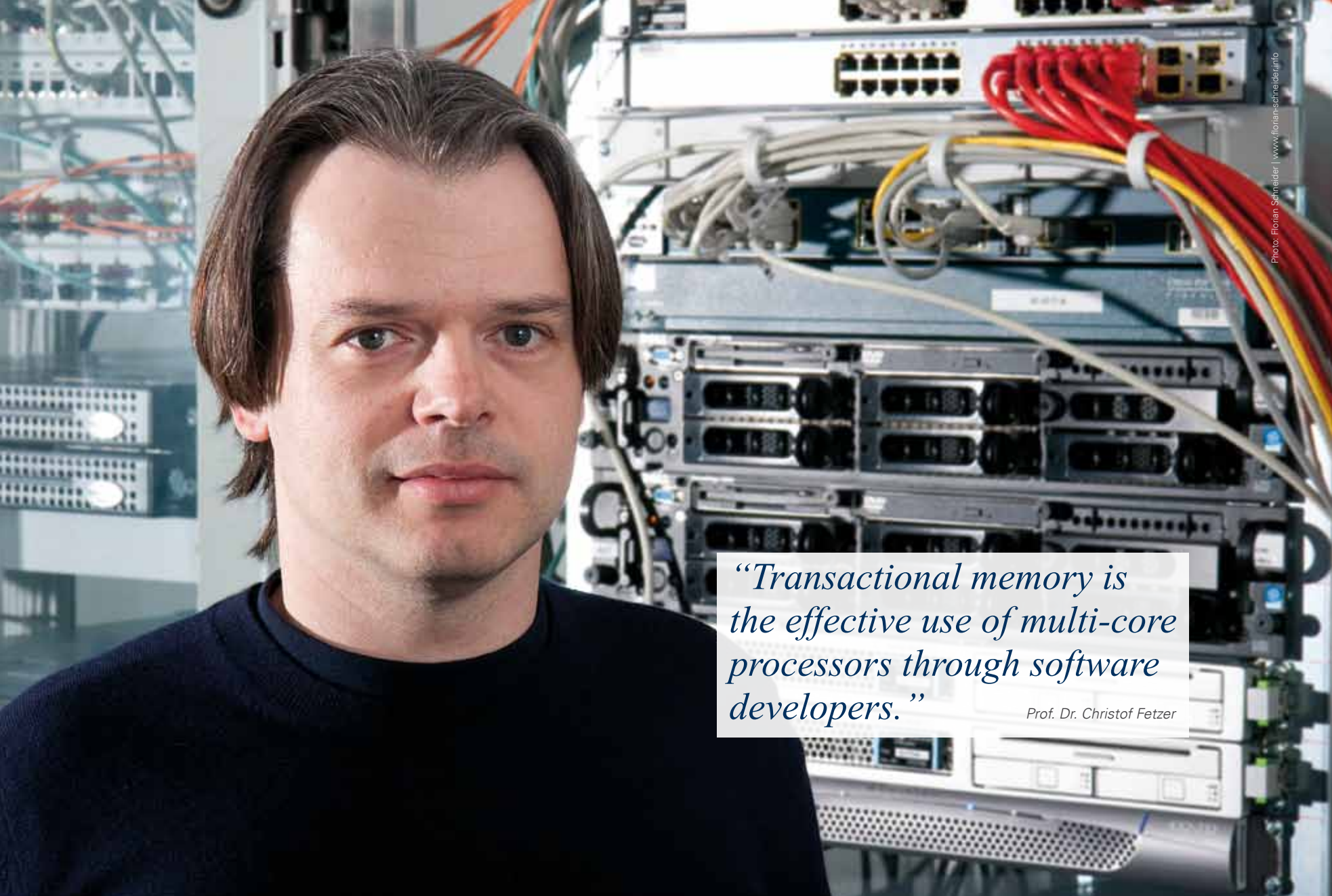
Project administration
Prof. Dr. Klaus Meißner
Prof. Dr. Alexander Schill

Financing institution
Federal Ministry of Education and Research

External cooperation partners
CAS Software AG, xima media GmbH

Research topics
Web Engineering, Intelligente UIs, Software-as-a-Service, Mobile RIA

http://www.cruise-projekt.de



"Transactional memory is the effective use of multi-core processors through software developers."

Prof. Dr. Christof Fetzer

Photo: Florian Schneider | www.florian-schneider.info

VELOX project

TRANSACTIONAL MEMORY FOR MULTI-CORE CHIPS

The adoption of multi- and many-core chips as the architecture-of-choice for mainstream computing will undoubtedly bring about profound changes in the way software is developed. Parallelism will likely be wide-spread in future software. Parallel and concurrent processes typically need to coordinate their computation and outputs. The major means for accomplishing this in current multi- and many-core systems is to let concurrent processes communicate over shared memory, called shared-memory synchronization. In the past, programmers have implemented synchronization mostly with locks. However, locks are too difficult to use correctly and efficiently, so locks are not a good tool for parallelizing a vast amount of software.

The transactional memory (TM) programming paradigm is a strong contender in becoming the approach of choice for replacing locks and implementing atomic operations in concurrent programming. Programmers can use it to declare that a sequence of operations has to be executed as a transaction that runs virtually atomic and isolated from other operations. Programmers do not need to implement these properties as this is ensured by a generic TM runtime system. This promises a great reduction in the complexity of both programming and verification.

In the EU-funded Velox project, TU Dresden is jointly working with AMD, RedHat, and 5 other universities to build a fully integrated TM system that covers all affected layers of the stack: application environments, programming language extensions, compilers, libraries, and novel hardware support for TM. TU Dresden in particular is designing new algorithms and implementations for TM (for both legacy hardware and for new hardware with TM extensions), developing compiler support for TM, and support for TM within software libraries. Our main focus is on providing a high-performance TM system that is still easy to use by the programmer.

Period
January 2008 – December 2010

Project administration for TUD
Prof. Dr. Christof Fetzer

Financing institution
EU 7th Framework

External cooperation partners
AMD, RedHat, University of Neuchâtel, Tel-Aviv University, BSC, EPFL, Chalmers University of Technology

Research topics
parallel computing, dependable systems, stream processing

http://www.velox-project.eu

“Multi-touch devices necessitate a completely new division of coordination between eye and hand.“

Prof. Dr.-Ing. habil. Rainer Groh

Photo: Florian Schneider | www.florian-schneider.info

[vi.c]

VISUALIZATION & INTERACTION FOR MULTI-TOUCH

The project vi.c is engaged in the research of efficient visualization tools and interaction mechanisms. Behind this research is heavily interconnected network data, emerging from the global usage of the internet. Information spaces contain numerous traces of communication and are fragmented, constituted of clusters of information in varying degrees of organization.

The objective is to render visible the covert and accumulated experiences of retrieval and browsing, in order to employ them within knowledge management. Concrete results of the project, which is carried out in cooperation between queo GmbH and the Professur für Mediengestaltung of the Institut für Software- und Multimediatechnik of the Technische Universität Dresden, are innovative algorithms and methods for search, assessment, and processing of knowledge.

In the process, algorithms for analysis and visualization are devised to assess and prepare items of knowledge according to their relevance towards search criteria. In addition, to support the exploration of this data, new interaction paradigms are necessary. Hence, one focus of the project is the analysis and systematization of information visualizations with regards to the visualization and interaction techniques involved.

Another focus is the research and development of interaction mechanisms using multi-touch technology. Natural and direct interaction using gestures creates potentially enhanced access to complex amounts of data, resulting in a search lead by the user's intuition within these spaces of data.

Period
March 2009 – February 2011

Project administration
Prof. Dr. Rainer Groh

Financing institution
European Union, Free State Saxony, European Regional Development Fund (ERDF)

External cooperation partner
queo GmbH Dresden

Research topics
Innovative visualization techniques for social software to support the acquisition of information in knowledge management

http://mg.inf.tu-dresden.de

"With the right data models, we can significantly improve the environmental aspects and the cost efficiency of energy cycles." Prof. Dr.-Ing. Wolfgang Lehner

Photo: Florian Schneider | www.florian-schneider.info

MIRACL energy

Balancing energy supply and demand

RESOURCE-EFFICIENT ELECTRICITY CYCLES

Rising electricity prices and heated debates on the nature of climate change necessitate new approaches and researchers who keep their cool while developing novel customer-friendly and yet environmentally friendly solutions. The increased integration of so-called green electricity has to prove beneficial not only for end-users but also for all producers and system operators within the whole electricity cycle – beginning with the power plant or wind farm, continuing over networks and infrastructures of various control instances, all the way to the end-users in their private homes or work offices.

MIRACLE is the keyword that sums up the efforts of the Chair of Databases and 7 other EU project partners to employ so-called "Smart Meters" in order to address the above mentioned challenge. The project's core consists of the efficient modeling of the complete electricity cycle and the development of feedback mechanisms between producers and consumers. The ultimate goal is to better balance offer and demand in a way that is cost-effective for both parties while simultaneously integrating as many renewable resources as possible.

The enormous resulting data load, however, poses certain difficulties: How can these data masses be processed and analyzed efficiently? How can past usage data be transformed into precise predictions of future demand? And how can short-term renewable resources be integrated most effectively based on the collected data?

Prof. Dr. Wolfgang Lehner, Chair of Databases: *"With our experience and research activities of our chair, we can address all these questions and contribute significantly to the development of a more environment-friendly and yet cost-effective energy cycle."*

Period
January 2010 – December 2012

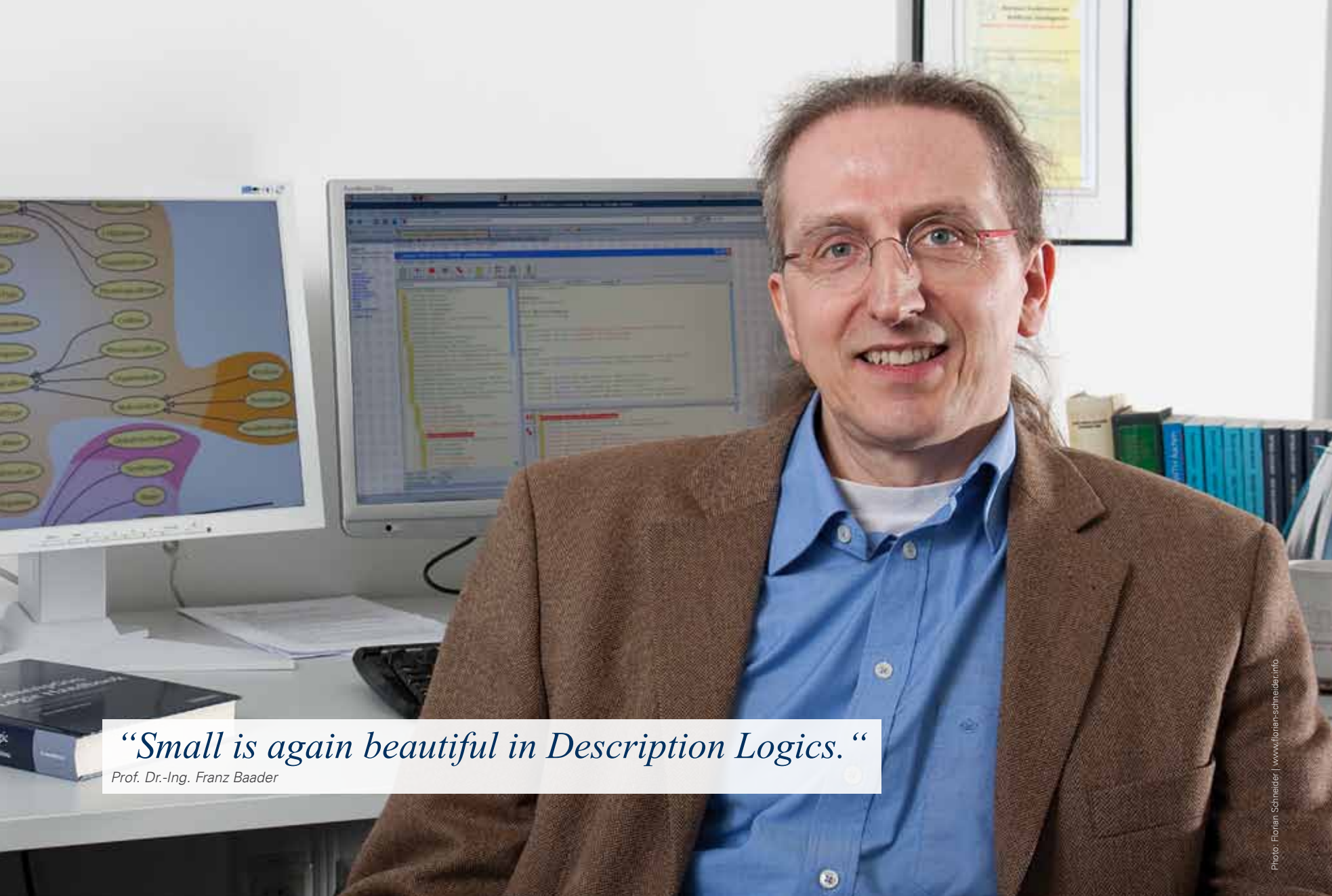
Project administration
Prof. Dr. Wolfgang Lehner

Financing institution
EU 7th Framework

External cooperation partners
SAP Research, Aalborg Universitet, CRES, EnBW, INEA, JSI, TNO

Research topics
Data Analysis, Prediction Models

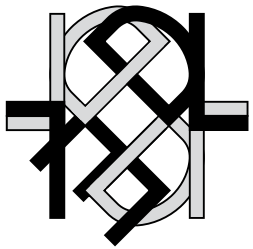
http://www.miracle-project.eu



“Small is again beautiful in Description Logics.“

Prof. Dr.-Ing. Franz Baader

Photo: Florian Schneider | www.florian-schneider.info



DESCRIPTION LOGICS WITH EXISTENTIAL QUANTIFIERS

Ontologies are used in Computer Science to achieve a common understanding of the important concepts of an application domain. For this purpose, they need to be represented in a formal language with well-defined semantics. This language must, on the one hand, be expressive enough to be able to represent all relevant concepts; but on the other hand, its expressiveness needs to be restricted so that automated processing is still possible.

Medical ontologies support the exchange of information between medical doctors, hospitals, and health insurance companies. They contain formal descriptions of diseases, anatomical concepts, medical procedures, and other important medical notions. Recently, Description Logics (DLs) have become the language of choice for representing medical ontologies. However, the large size and complexity of medical ontologies has turned out to be a major challenge for the developers of the DL systems.

In the project „Description Logics with existential quantifiers and polynomial subsumption problem, and their application to biomedical ontologies," we have developed a new class of Description Logics, the so-called $\mathcal{EL}$ family. Its expressiveness is tailored towards representing medical ontologies, and it allows for fast automated processing. Highly optimized implementations of the procedures developed in the project can classify the large medical ontology SNOMED CT, which has almost 400,000 concepts, in less than a second. Another success of the project is the fact that a member of the $\mathcal{EL}$ family was adopted as a subprofile in the new standard for the Web Ontology Language, OWL 2.

Period
June 2006 – January 2010

Project administration
Prof. Dr.-Ing. Franz Baader

Financing institution
German Research Foundation (DFG)

External cooperation partners
University of Manchester, Universitätsklinikum Freiburg, International Health Terminology Standards Organization

Research topics
Intelligent Formal Systems, Description Logics

http://lat.inf.tu-dresden.de/el

Microsoft awards the IT Academy to the university of the team that won the Germany finals of the Imagine Cup on June 18, 2009.

Photo: Silvia Kapplusch

CONFERENCES & RESEARCH PRICES

Annually, the Computer Science Faculty runs numerous international and national conferences and technical conferences on various IT topics and is represented actively worldwide through its contributions.

Technical lectures in Australia, the USA, China, Indonesia, and Europe, as well as numerous publications and research visits from renowned scientists from all over the world, reflect the high recognition of the university's research results. Extensive and numerous industrial co-operations all around the world guarantee innovative ideas and a high level of education for students in the Computer Science Faculty.

Through numerous prizes on the Day of the Faculty, IT companies honor outstanding performances of students. On October 8, 2009 the SAP Dissertation Prize went to Ms. Dr. Sandra Steinbrecher for her work "Multiple Security in Reputation Systems – Request Analysis and Realization Possibilities". The Lehmann Prize for a outstanding student work on the topic of Computer Science was received by Mr. Tobias Hilbrich for his work "Centralized Deadlock Detection for MPI Applications: Complexity and Parallelization".

The AMD Prize appreciated the best diploma thesis and was given to Mr. Ludwig Hähne for his thesis titled "Syntactic Integration of Product Information from Semi-Structured Resources". The IBM Germany Development Ltd. gave an award to the three best preliminary diplomas, which came from Mr. Andreas Ecke, Mr. Björn Langer and Mr. Eric Brachmann.

Press Reports of the Faculty

Dr. Rainer Böhme, currently at Berkley's International Computer Science Institute, received the Gordon Prize of the Robert H. Smith School of Business at the University of Maryland on October 14, 2009.

After nearly 10 month's work, the Queens@TUD finished its calculations on the 26-Female-Problem on July 11, 2009. With this the previous world record, from the calculations on the 25-Female-Problem from July 2005, was broken after 49 months.

In the current university ranking of the Center for University Development (CHE) 2009, the Faculty of Computer Science at the TU Dresden reaches the top group in the categories "Programs Offered" and "Study Situation Overall".

PRIME was voted the Project of the Month January 2009 by the European Commission, Head Office for Information Society and Media.

nanometis, a planned by-product of the Biotechnological Centre at the TU Dresden, was an award winner in the conception phase of the business plan competition "Science4Life Venture Cup 2009".

With their project, "Talk to aAqua", the team from the Technische Universität Dresden won the Germany finals of the Imagine Cup.

Niels v. Festenberg from the Institute for Software and Multimedia Technology simulated snow and other pour-able fabrics graphically on the computer. During this year's "Eurographics Workshop of Natural Phenomena" in Munich he "elicited thunderous applause from the colleagues" with his display.

"ClusterMeister", a team of students from the Indiana University and the Technische Universität Dresden, achieved first place in the SC08 Cluster Challenge, an international competition in the area of energy efficient high-performance calculation.

Photo: Lothar Sprenger | www.losprenger.de

INTERNAL AND EXTERNAL RESEARCH CENTERS

International Center for Computational Logic

The International Center for Computational Logic (ICCL) is an interdisciplinary center of competence in research and teaching in the field of Computational Logic, with special emphasis on Algebra, Logic, and Formal Methods in Computer Science.

It is essentially borne by the Artificial Intelligence Institute and the Institute of Theoretical Computer Science at the Faculty of Computer Science as well as by the Institute of Algebra at the Faculty of Science.

ICCL coordinates the European Master's Program in Computational Logic, one of the very few programs of study supported by Erasmus Mundus.

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http://www.computational-logic.org

Biotechnology Center (BIOTEC)

The Biotechnology Center of the Technische Universität Dresden is a unique interdisciplinary center focusing on research and education in molecular bioengineering. The BIOTEC hosts top international research groups dedicated to genomics, proteomics, biophysics, cellular machines, molecular genetics, tissue engineering, and bioinformatics.

The BIOTEC has some 230 members from 35 countries from Eastern and Western Europe, Asia, Australia, and America that work in the fields of biology, medicine, physics, chemistry, computer science, and engineering.

The BIOTEC provides excellent lab facilities and an infrastructure which enables collaboration with other companies residing in the same building.

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http://www.biotec.tu-dresden.de

Future Manufacturing at SAP Research

At the campus-based Engineering Center SAP Research CEC Dresden, advanced software technologies for future manufacturing environments are being investigated such as the early prediction of maintenance tasks based on specific failure models. The solution is tightly integrated both with the manufacturing and with the enterprise resource planning layer. Another area is the control of complex logistics chains. Based on automatic event processing, important state changes of a transportation system are analyzed, integrated, and evaluated within higher control layers.

Co-operations between SAP and TU Dresden on these and other subjects include a joint PhD program and several consortium projects.

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alexander.schill@tu-dresden.de
http://www.sap.com/company/research

Photo: Conne van d'Grachten

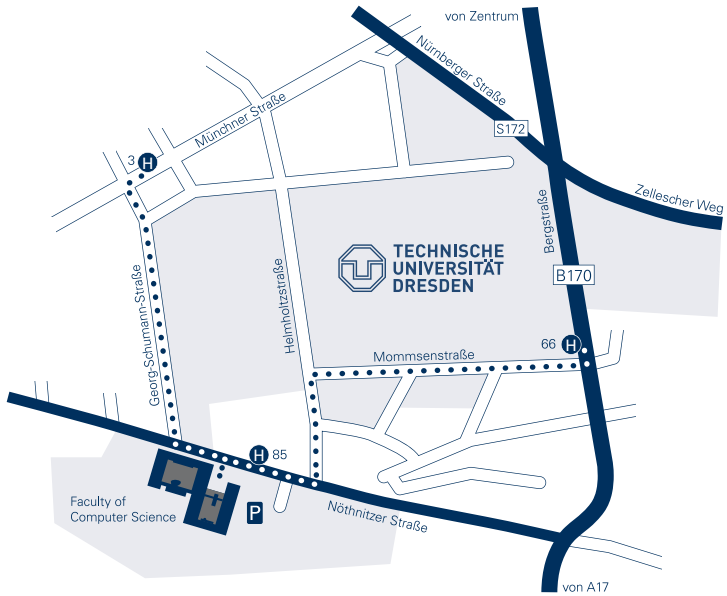
DIRECTIONS TO THE FACULTY OF COMPUTER SCIENCE

The building at Nöthnitzer Straße 46 can be reached directly by ***public transport***. From the stops Münchner Platz of streetcar-line 3, Mommsenstraße of bus-line 66, and Helmholtzstraße of bus-line 85, the building can easily be reached within a few minutes.

From the stop *Münchner Platz*, walk up Georg-Schumann Straße to the end where it meets Nöthnitzer Straße (about 450 meters). There you can already see the faculty building on the opposite side, with the main entrance about 50 meters to the left.

From the stop *Mommsenstraße*, walk up Bergstraße a few meters, then turn right onto Mommsenstraße and follow it to the end where it meets Helmholtzstraße (about 450 meters). Turn left and walk up Helmholtzstraße to the end where it meets Nöthnitzerstraße (250m). From here, the main entrance of the faculty building is about 100 meters to the right on the opposite side.

The bus stop *Helmholtzstraße* is located directly in front of the building. It is most convenient for reaching the faculty building from within Dresden city via the interchanges "Tharandter Straße", "Rathaus Plauen" or "Wasaplatz".



If you arrive by ***airplane***, you can take a local train ("S-Bahn" 2). The S-Bahn leaves every 30 minutes from the basement of the Dresden Airport to the Dresden main train station ("Hauptbahnhof").

Arriving by ***train***, get off at the Dresden main train station ("Hauptbahnhof"), take streetcar-line number 3 towards "Coschütz" and get off at stop "Münchnerplatz".

By ***car*** on the Autobahn A4 from Chemnitz/Leipzig or Berlin, leave A4 at Dreieck Dresden-West and change to Autobahn A17 in the direction to Prague. Leave A17 at the exit Südvorstadt. Drive along the B170 towards "Zentrum". Follow the signs in the direction of Plauen and turn left onto Nöthnitzer Straße. The faculty building is about 500 meters further on the left side.

LIST OF PROFESSORS (1/4)

Chair of Industrial Communications
Institute of Applied Computer Science

Prof. Dr.-Ing. habil.
Martin Wollschlaeger
Director of Institute

- Industrial communication systems – Ethernet-based systems, fieldbus systems, management of heterogeneous networks
- Information models in automation, device and interaction models in Life Cycle, semantic annotations, continuous description methods
- Industrial Internet – integration of IT solutions and automation systems, web technologies in automation

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Chair of Human-Computer Interaction
Institute of Applied Computer Science

Prof. Dr. rer. nat. habil.
Gerhard Weber

- User-centered design of adaptable, multimodal and multimedia user interfaces
- Ambient Assisted Living – navigation and new mobile services for mobility impaired people
- Adaptation and adaptivity in time-dependent media for blind, visually impaired, deaf, and dyslexic people
- Digital libraries for readers with special needs

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Chair of Modeling and Simulation
Institute of Applied Computer Science

Prof. Dr. rer. nat.
Oliver Rose
Vice Dean

- Modeling, simulation, and analysis of the material flow in complex production facilities such as semiconductor manufacturing facilities or assembly lines for planes
- Methods for the performance evaluation of production facilities
- Robust methods for the operational control of production facilities
- Tool-independent modeling of production facilities (Modeling standards)

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Chair of Technical Information Management Systems

Institute of Applied Computer Science

Prof. Dr.-Ing. habil.
Klaus Kabitzsch

- Distributed, linked automation systems, field-buses, applications in plants and buildings, ambient assisted living
- Wireless sensor networks
- Process identification, advanced control, predictive maintenance
- Design, test and diagnosis tools for automation systems, PLC, embedded systems
- LONWORKS reference asset

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Chair of Bioinformatics

Institute of Artificial Intelligence

Prof. Dr.-Ing.
Michael Schroeder

- Analysis of gene expression and protein interaction data
- Gene annotation with text-mining and ontologies
- Applications in neurodegeneration and pancreas cancer

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Chair of Knowledge Representation and Reasoning

Institute of Artificial Intelligence

Prof. Dr. rer. nat. habil.
Steffen Hölldobler
Dean of Studies for international study programs,
Acting Director

- Logic and Logic Programming
- Knowledge Representation and Inference
- Connectionist Systems

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LIST OF PROFESSORS (2/4)

Chair of Multimedia Technology
Institute of Software and Multimedia Technology

Prof. Dr.-Ing.
Klaus Meißner
Director of Institute

- Development methods and system architecture for distributed, adaptive, multimedia applications in mobile and web scenarios
- Advanced rich media user interface techniques for web service oriented applications
- Collaboration and communication techniques in virtual teams, communities and organizations
- Personal information life cycle management: semantic modeling and management of multimedia information, documents and applications

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Chair of Computer Graphics and Visualization
Institute of Software and Multimedia Technology

Prof. Dr. rer. nat.
Stefan Gumhold

- Development of interactive 3D applications for PC and VR systems
- Scanning and processing of static and dynamic geometry models
- Model reduction for the interactive simulation of natural phenomena
- Basic research and development of customized applications in the domain of scientific visualization

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Chair of Media Design
Institute of Software and Multimedia Technology

Prof. Dr.-Ing. habil.
Rainer Groh

- Concept and design of interactive systems
- 3D-Projection principles according to human perception
- Design methods of Human-Computer Interaction

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Chair of Software Technology
Institute of Software and Multimedia Technology

Prof. Dr. rer. nat. habil.
Uwe Aßmann

Software technology deals with the systematic construction of large software systems.

- Component-based software engineering for software reuse
- Model-driven development and language engineering
- Construction of software product lines
- Application of logic and semantic in software engineering
- Energy-aware and real-time software

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Workgroup Didactics of Computer Science
Institute of Software and Multimedia Technology

Prof. Dr. paed. habil.
Steffen Friedrich
Commissioner of Studies
for teaching post courses

- Teaching methodology of ICT / ICT teaching
- Didactical aspects of e-learning
- Educational standards of ICT at schools

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Chair of Databases
Institute of Systems Architecture

Prof. Dr.-Ing.
Wolfgang Lehner
Director of Institute

- Data Streams
- AOS: Sampling in databases
- Model-Driven Data Engineering
- Data-aware service orchestration
- Database technology for analysis of large datasets (Data Warehouse systems, OLAP and Data Mining support)
- Advanced Data Analysis for Photo Mask Production

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LIST OF PROFESSORS (3/4)

Chair of Operating Systems
Institute of Systems Architecture

Prof. Dr. rer. nat.
Hermann Härtig

- Microkernel-based Operating Systems
- Real-Time Systems, Embedded Systems
- Secure-System Architectures
- Virtual-Machine Technology
- Interaction HW/SW Architectures

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Chair of Privacy and Data Security
Institute of Systems Architecture

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Andreas Pfitzmann
Dean

- Privacy-enhancing technologies (identity management, anonymous communication)
- Multimedia security (multimedia forensics, steganography and steganalysis, digital watermarking)
- Multilateral security in and by distributed systems (design of secure distributed applications, reputation systems, biometrics)
- Channel coding theory

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Chair of Computer Networks
Institute of Systems Architecture

Prof. Dr. rer. nat. habil.
Dr. h. c.
Alexander Schill

- Service-oriented Architectures for the Future Internet
- Mobile and Ubiquitous Computing
- Real-Time Collaboration
- Network Security and Network Design
- Internet Information Retrieval

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Chair of Systems Engineering
Institute of Systems Architecture

Prof. Dr.
Christof Fetzer

The more computers are being trusted, the more necessary it becomes to learn how to create computer-based systems which you can rely on. The focus of this group lies on the investigation into how you can build trustworthy systems which range from uncritical systems in private households to safety-critical systems.

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Chair of Embedded Systems
Institute of Computer Engineering

Prof. Dr.-Ing.
Christian Hochberger
Dean of Studies for German study programs, Director of Institute

The research of this group is focused on increasing the abstraction level of the development process of Embedded Systems. To this end, we develop tools to simplify the usage of reconfigurable architectures, enable object oriented languages using the example of Java, and develop innovative debugging technologies.

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Chair of Computer Architecture
Institute of Computer Engineering

Prof. Dr. rer. nat.
Wolfgang E. Nagel

- Software tools for the support of programming and optimization
- Programming methods and technologies for high-performance computers
- Grid-computing
- Architecture and performance analysis of high-performance computers
- Algorithms and methods for the modeling of biological processes

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LIST OF PROFESSORS (4/4)

Chair of VLSI Design, Diagnostics and Architecture Institute of Computer Engineering

Prof. Dr.-Ing. habil.
Rainer G. Spallek

- Circuit, Processor and System Design
- Modeling and Simulation of Electronic Systems
- Test and Diagnosis of Complex Systems
- Dependability and Heterogeneous System Architectures

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Chair of Automata Theory
Institute of Theoretical Computer Science

Prof. Dr.-Ing.
Franz Baader
Director of Institute

- Knowledge Representation (in particular, Description and Modal Logics)
- Automated Deduction (in particular, Term Rewriting, Unification, and Constraint Solving)
- Automata Theory (in particular its applications in logics)

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Chair of Algebraic and Logical Foundations of Computer Science Institute of Theoretical Computer Science

Prof. Dr. rer. nat.
Christine Baier

- Modeling
- Specification and analysis of reactive systems
- Model checking
- Coordination languages
- Probabilistic systems
- Verification of quantitative properties

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LECTURERS

Chair of Foundations of Programming
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- Automata theory
- Formal models for natural language processing
- Functional programming

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Applied Knowledge Representation and Reasoning
Institute of Artificial Intelligence

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- Intelligent Agents, Search Algorithms, Discrete Optimization, Planning
- Logic and Knowledge Representation, Hybrid Knowledge Models, Problem-solving, Uncertain Knowledge and Reasoning
- Case-Based Reasoning, Making Complex Decisions
- Methods of Machine Learning

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